



IN THE UNITED STATES PATENT  
AND TRADEMARK OFFICE

PATENT

Applicant: Mario DiMarco

Docket No.: 46180.3900

Serial No.: 09/224,340

Client Ref: A62-17022-US

Filing Date: December 31, 1998

Group Art Unit: 2841

Title:

Examiner: Dinh, T.

MODIFIED IMA CABINET  
ARCHITECTURE

AFFIDAVIT OF MARIO DIMARCO

Assistant Commissioner for Patents  
Washington, D.C. 20231-0001

RECEIVED

DEC 05 2000

TECHNOLOGY CENTER 2800

Dear Assistant Commissioner:

I, MARIO DIMARCO, declare as follows:

1. I am the sole inventor of the subject matter described and claimed in United States Patent Application Serial No. 09/224,340, filed December 31, 1998, entitled MODIFIED IMA CABINET ARCHITECTURE, which subject matter is disclosed and claimed in the above-referenced patent application.

2. Oftentimes, in an industry as specialized as the avionics industry, potential customers meet with companies in the business of providing avionics systems in order to survey technologies under development. Such meetings are not for the purpose of consummating a sale (or even offering goods for sale), but rather to inform and educate potential customers on the future of the industry. Such meetings provide a preview of ideas that may later develop in the avionics industry.

3. On July 2, 1997, Parm Narveson, Khosrow Youssefi, and I met with representatives from Airbus. At this time, Airbus was surveying up and coming technology in the field of avionics systems.

4. Since Airbus' purpose in meeting with Honeywell was only for sampling "up and coming" technology, at no time did Honeywell and Airbus discuss offering for sale or the purchasing of such technology.

5. Honeywell presented a conception of ideas for improving current avionics technology. The presentation to Airbus focused on features of various avionics systems, both existing and under development. For example, the presentation included an overview of considerations in the packaging of PCBs, including line replaceability, an A/C cooling interface, environmental requirements (e.g., EMI, thermal, and vibration), and interconnect complexity. Honeywell portrayed card cages in comparison to modules and line replaceable units.

6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so

made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced patent application or any patent issuing thereon.

Dated: 11/21/2000

Mario DiMarco  
Mario DiMarco

STATE OF Arizona  
COUNTY OF Maricopa

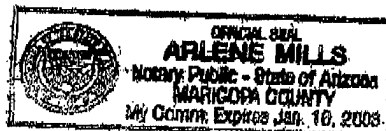
On this day, Nov 21 2000, before me, Arlene Mills,  
a notary public in and for said county, personally appeared: Mario DiMarco

☐ personally known to me or  
☒ proved to me on the basis of satisfactory evidence

to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal:

Arlene Mills  
Signature of Notary Public





11/21/00 15:49 □ :01/03 NO:569

PATENT

**IN THE UNITED STATES PATENT  
AND TRADEMARK OFFICE**

Applicant:	Mario DiMarco	Docket No.:	46180.3900
Serial No.:	09/224,340	Client Ref:	A62-17022-US
Filing Date:	December 31, 1998	Group Art Unit:	2841
Title:	MODIFIED IMA CABINET ARCHITECTURE	Examiner:	Dinh, T.

**AFFIDAVIT OF KHOSROW YOUSSEFI**

Assistant Commissioner for Patents  
Washington, D.C. 20231-0001

**RECEIVED**

**DEC 05 2000**

Dear Assistant Commissioner:

TECHNOLOGY CENTER 2800

I, KHOSROW YOUSSEFI, declare as follows:

1. I am ENGINEERING MANAGER [INSERT TITLE] at Honeywell International Inc.
2. Oftentimes, in an industry as specialized as the avionics industry, potential customers meet with companies in the business of providing avionics systems in order to survey technologies under development. Such meetings are not for the purpose of consummating a sale (or even offering goods for sale), but rather to inform and educate potential customers on the future of the industry. Such meetings provide a preview of ideas that may later develop in the avionics industry.
3. On July 2, 1997, Parm Narveson, Mario DiMarco, and I met with representatives from Airbus. At this time, Airbus was surveying up and coming technology in the field of avionics systems.
4. Since Airbus' purpose in meeting with Honeywell was only for sampling "up and coming" technology, at no time did Honeywell and Airbus discuss offering for sale or the purchasing of such technology.
5. Honeywell presented a conception of ideas for improving current avionics technology. The presentation to Airbus focused on features of various avionics systems, both existing and under development. For example, the presentation included an overview of considerations in the packaging of PCBs, including line replaceability, an A/C cooling interface, environmental requirements (e.g., EMI, thermal, and vibration), and interconnect complexity. Honeywell portrayed card cages in comparison to modules and line replaceable units.
6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the

United States Code, and that such willful false statements may jeopardize the validity of the above-referenced patent application or any patent issuing thereon.

Dated: 21 Nov 2000

Khosrow Youssefi  
Khosrow Youssefi

STATE OF Az  
COUNTY OF Maricopa

On this day, Nov. 21, 2000, before me, Arlene Mills,  
a notary public in and for said county, personally appeared: Khosrow Youssefi

☐ personally known to me or  
☒ proved to me on the basis of satisfactory evidence

to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal:

Arlene Mills  
Signature of Notary Public





PATENT

**IN THE UNITED STATES PATENT  
AND TRADEMARK OFFICE**

Applicant: Mario DiMarco

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MODIFIED IMA CABINET  
ARCHITECTURE

**AFFIDAVIT OF PARM NARVESON**

Assistant Commissioner for Patents  
Washington, D.C. 20231-0001

**RECEIVED**  
**DEC 05 2000**  
**TECHNOLOGY CENTER 2800**

Dear Assistant Commissioner:

I, PARM NARVESON, declare as follows:

1. I am \_\_\_\_\_ [INSERT TITLE] at Honeywell International Inc.

2. Oftentimes, in an industry as specialized as the avionics industry, potential customers meet with companies in the business of providing avionics systems in order to survey technologies under development. Such meetings are not for the purpose of consummating a sale (or even offering goods for sale), but rather to inform and educate potential customers on the future of the industry. Such meetings provide a preview of ideas that may later develop in the avionics industry.

3. On July 2, 1997, Parm Narveson, Joseph Youseffi, and I met with representatives from Airbus. At this time, Airbus was surveying up and coming technology in the field of avionics systems.

4. Since Airbus' purpose in meeting with Honeywell was only for sampling "up and coming" technology, at no time did Honeywell and Airbus discuss offering for sale or the purchasing of such technology.

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6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the

United States Code, and that such willful false statements may jeopardize the validity of the above-referenced patent application or any patent issuing thereon.

Dated: \_\_\_\_\_

\_\_\_\_\_  
Parm Narveson

STATE OF \_\_\_\_\_  
COUNTY OF \_\_\_\_\_

On this day, \_\_\_\_\_, before me, \_\_\_\_\_,  
a notary public in and for said county, personally appeared: \_\_\_\_\_

- ☐ personally known to me or  
☐ proved to me on the basis of satisfactory evidence

to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal:

\_\_\_\_\_  
Signature of Notary Public

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July 1997

# Packaging



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Integration Technology  
July 1997



## Considerations/ criteria / drivers

- **Line Replaceability**
  - Handling
  - Insertion / Removal
- **Adaptability** (For Retrofit on current aircraft or changes on current installations)
  - Mechanical Dimensions
  - A/C Cooling Interface
  - Scalability
- **Meets Environmental Requirements**
  - EMI
  - Thermal
  - Vibration
- **Interconnect Complexity**



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July 1997

# Packaging Options

- **Card Cage**
  - Sealed Cabinet (EMI)
  - Individual Cards
    - ◆ Unprotected
    - ◆ Card Edge Connectors
- **Slim Line-Replaceable Module (S-LRM)**
  - Sealed Cabinet (EMI)
  - Individual Modules
    - ◆ Protected for Handling
    - ◆ Sealed for EMI
    - ◆ Aircraft Quality Connectors
- **Line Replaceable Unit (LRU per ARINC 600)**



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Integration Technology  
July 1997

# Packaging Trades

Top Level Need	Primary Consideration	Card Cage	S-LRM	LRU
Line Replaceability	Handling	No Protection (Card or Conn)	Full Protection (Card and Conn)	Full Protection
	Insertion / Removal	<ul style="list-style-type: none"> <li>• Must open cab to remove cards</li> <li>• Pin Damage Susceptibility</li> </ul>	<ul style="list-style-type: none"> <li>• Module Replacement</li> </ul>	<ul style="list-style-type: none"> <li>• Unit Replacement</li> </ul>
Adaptability	Mechanical Dimension	Small card size to accommodate interface hardware	<ul style="list-style-type: none"> <li>• Max card size</li> <li>• Min. chassis hwr</li> <li>• Highest Weight</li> </ul>	Small card size to accommodate interface hardware
	A/C Wiring and Cooling Interface	Can be accommodated on existing A/C	Can be accommodated on existing A/C	Std Arinc 600
	Scalability	New Backplane	New Module	New LRU
	EMI	Protection at Cabinet Level	Protection at Module and Cabinet Level	Protection at LRU level
Meets Environmental Requirements	Thermal	Limited Card Cooling Options	Heat Sinks avail. at module sides	Limited Card Cooling Options
	Vibration	Support at Card Level	Modular Design Inherently strong	Support at Card Level
	Interconnect Complexity	<ul style="list-style-type: none"> <li>• 2-Layers on interconnect</li> <li>• High pin count</li> </ul>	<ul style="list-style-type: none"> <li>• Single connector direct to A/C wiring</li> <li>• Minimize pin count</li> <li>• Pin Limited between modules</li> </ul>	<ul style="list-style-type: none"> <li>• 2-Layers on interconnect</li> <li>• High pin count</li> </ul>



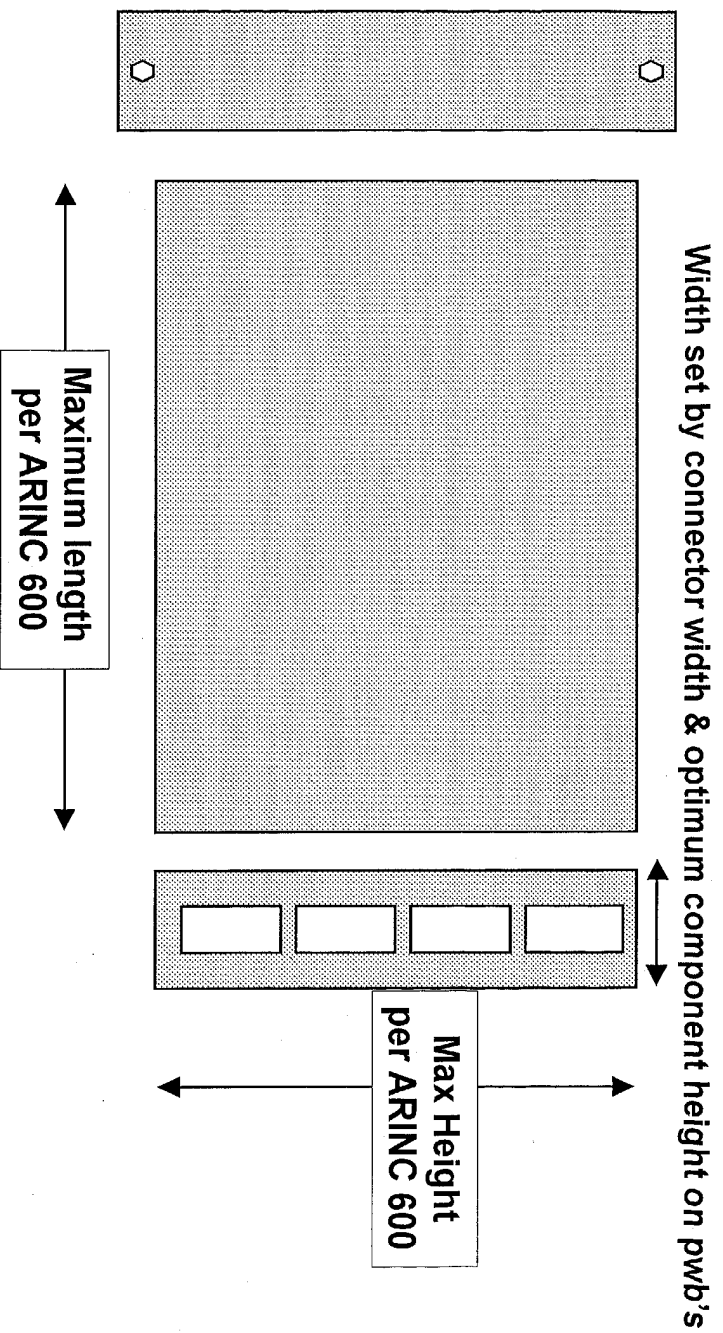
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Integration Technology  
July 1997

**Honeywell**

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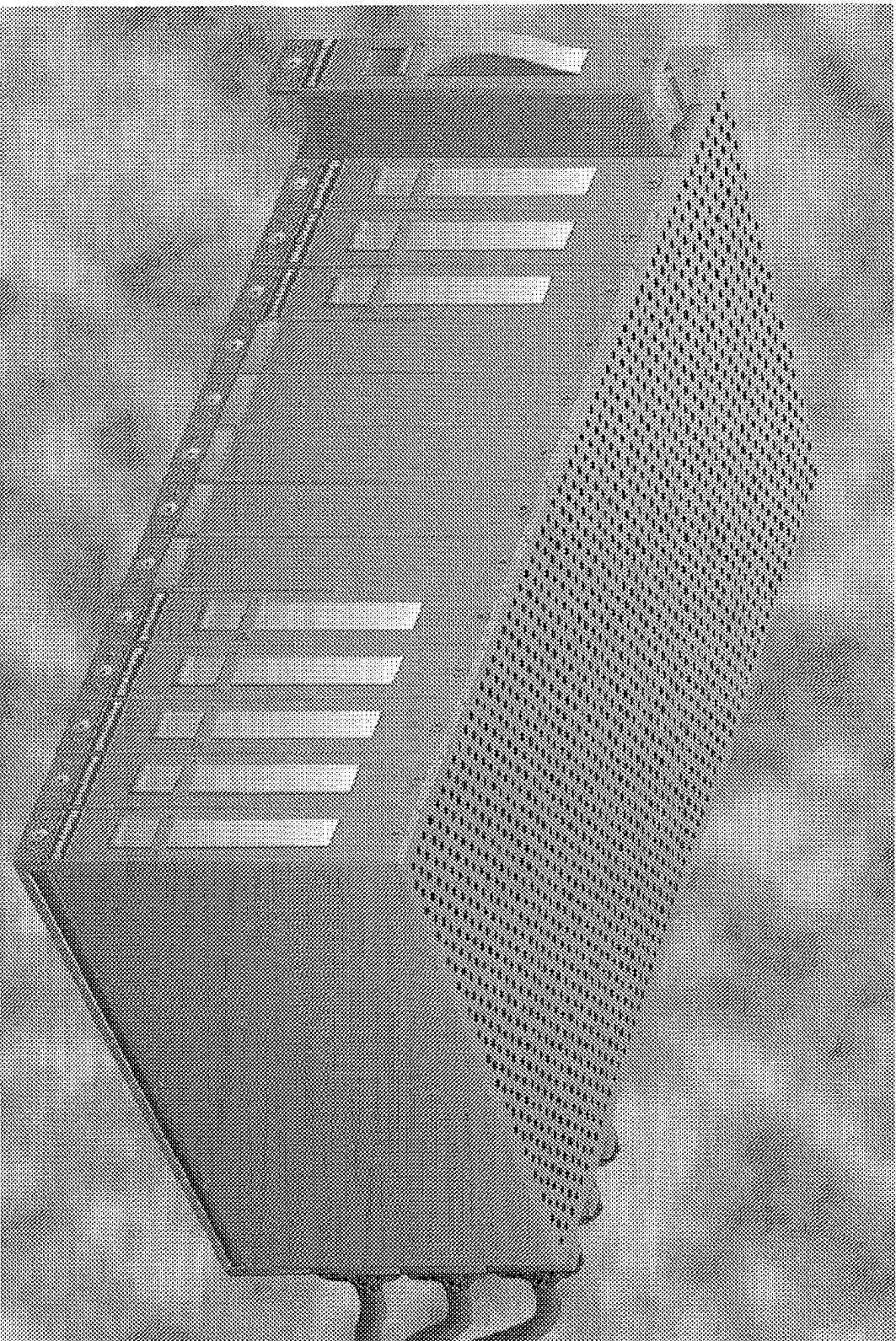
# Recommendation

- Slim Line-Replaceable Module
  - Direct “high quality” connector to A/C Wiring
  - Maximize card area



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July 1997

# IMA-2000 Cabinet



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7

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